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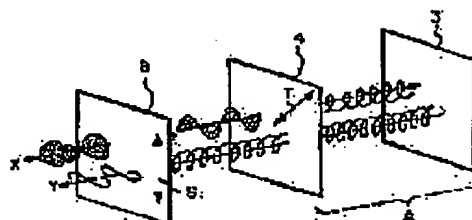
(54) INFORMATION RECORDING MEDIUM, INFORMATION CARD, AND METHOD AND APPARATUS FOR INFORMATION REPRODUCTION

(57)Abstract:

PURPOSE: To provide an information recording medium not allowing a visual recognition of the recorded.

CONSTITUTION: Passing through the polarization filter B, an incident beam X is subjected to a straight line deflection in a same direction of the orientation direction S, after that, passing through a drawing orientation film 4, it is further subjected to polarization in a same

direction of the orientation direction T. As a result, the beam passed through the drawing orientation film 4 becomes one subjected to elliptic polarization. Then, the beam subjected to elliptic polarization reflects on a metallic reflection beam Y via the drawing orientation film 4 and polarization film B. Since the reflection beam Y becomes one that is affected by the orientation of the drawing orientation film 4 and has the beam strength variable depending on its wave length, it can be distinguished between it and the beam in the part where the orientation is released.



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CLAIMS

[Claim(s)]

[Claim 1] The information record medium characterized by carrying out the laminating of the orientation layer by which orientation was carried out in the fixed direction in the information record medium which can reproduce information optically on the top face of a reflecting layer which reflects incident light.

[Claim 2] The information record medium according to claim 1 characterized by carrying out the laminating of the protective layer to the top face of said orientation layer.

[Claim 3] The information card characterized by forming an information record medium according to claim 1 or 2 in plate-like some or plate-like all of a base material.

[Claim 4] The information card according to claim 3 characterized by carrying out the laminating of the heat-resistant layer which intercepts heat conduction on the inferior surface of tongue of said reflecting layer.

[Claim 5] From the information record medium which comes to carry out a laminating, the orientation layer of which the orientation of the field corresponding to recording information was canceled, and a reflecting layer Are the information playback approach which reproduces the above-mentioned recording information, and incident light is polarized in the direction of orientation of the above-mentioned orientation layer, and the different direction. The information playback approach characterized by reflecting this incident light that polarized by the reflecting layer through the above-mentioned orientation layer, recognizing the field where the orientation of the above-mentioned orientation layer was canceled by that reflected light, and reproducing the above-mentioned recording information.

[Claim 6] A luminescence means to be the information regenerative apparatus which reproduces information and to irradiate exposure light from the information record medium which comes to carry out the laminating of the orientation layer of which the orientation of the field corresponding to recording information was canceled, and the reflecting layer, The polarization film which has the polarization direction which is inserted between this luminescence means and the above-mentioned information record medium, and is different from the direction of orientation of the above-mentioned orientation layer, The information regenerative apparatus characterized by having a detection means to detect the quantity of light of the reflected light which the above-mentioned exposure light which penetrated this polarization film and the above-mentioned orientation layer reflected by the above-mentioned reflecting layer, and a playback means to generate playback information based on the detection result of this detection means.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to an information record medium, an information record card, the information playback approach, an information regenerative apparatus, and the information record playback approach.

[0002]

[Description of the Prior Art] Although the information which identifies goods, such as a bar code, was the visible information which can carry out direct recognition, there is from a viewpoint which prevents forgery to make such information into invisibility. A bar code and a pattern are imprinted to a transparent material, or the technique which carries out [the technique] transparence printing and is made into invisibility from such a request is developed. and the colorless ingredient which has an absorption property on specific wavelength as an ingredient used for such an application -- or specific wavelength was absorbed and the almost colorlessness ingredient which emits the light of different wavelength from the absorption wavelength was developed.

[0003] By the way, generally, when recording information, such as a bar code, on an information record medium, the case where different information for every information record medium is recorded, and the information same, to two or more information record media may be recorded. The former is a case in order to manage goods according to an individual at the store where goods were delivered, so that different information for every information record medium may be recorded, and the latter is a case so that information, such as a price, may be recorded on two or more information record media, before shipping goods. When printing the information which differs for every information record medium using a thermal head in applying the ingredient mentioned above to the former and applying to the latter, pattern printing of the above-mentioned ingredient was carried out to the field according to the information which should be recorded, and the information record medium which recorded the same information was created in large quantities.

[0004]

[Problem(s) to be Solved by the Invention] By the way, the above-mentioned ingredient has the perfect color that it is not transparent and colorless and general a little thin. Especially a leuco color or a chelate type coloring mold color has many black things which it is, and are carried out and are colored green. Therefore, when the laminating of the concealment layer was not carried out on the layer which recorded information, the recorded information could not be completely concealed to the conventional information record medium, but it had the fault that forgery of an information record medium was easy. While offering the information record medium and information card which this invention is made in view of the starting situation, and prevented from viewing the recorded information completely, it aims at reproducing the information recorded from these.

[0005]

[Means for Solving the Problem] If it is in a configuration according to claim 1 in order to solve the above-mentioned technical problem, in the information record medium which can reproduce information

optically, it is characterized by carrying out the laminating of the orientation layer by which orientation was carried out in the fixed direction on the top face of a reflecting layer which reflects incident light.

[0006] Moreover, if it is in a configuration according to claim 2, it is characterized by carrying out the laminating of the protective layer to the top face of said orientation layer.

[0007] Moreover, if it is in a configuration according to claim 3, it is characterized by forming an information record medium according to claim 1 or 2 in plate-like some or plate-like all of a base material.

[0008] Moreover, if it is in a configuration according to claim 4, it is characterized by carrying out the laminating of the heat-resistant layer which intercepts heat conduction on the inferior surface of tongue of said reflecting layer.

[0009] moreover, if it is in a configuration according to claim 5, the orientation layer of which the orientation of the field corresponding to recording information was canceled, and a reflecting layer from the information record medium which comes to carry out a laminating Are the information playback approach which reproduces the above-mentioned recording information, and incident light is polarized in the direction of orientation of the above-mentioned orientation layer, and the different direction. It is characterized by reflecting this incident light that polarized by the reflecting layer through the above-mentioned orientation layer, recognizing the field where the orientation of the above-mentioned orientation layer was canceled by that reflected light, and reproducing the above-mentioned recording information.

[0010] Moreover, a luminescence means to be the information regenerative apparatus which reproduces information and to irradiate exposure light from the information record medium which comes to carry out the laminating of the orientation layer of which the orientation of the field corresponding to recording information was canceled, and the reflecting layer if it is in a configuration according to claim 6, The polarization film which has the polarization direction which is inserted between this luminescence means and the above-mentioned information record medium, and is different from the direction of orientation of the above-mentioned orientation layer, The above-mentioned exposure light which penetrated this polarization film and the above-mentioned orientation layer has a detection means to detect the quantity of light of the reflected light reflected by the above-mentioned reflecting layer, and a playback means to generate playback information based on the detection result of this detection means.

[0011]

[Function] If it is in a configuration according to claim 1, since orientation of the orientation layer is carried out in the fixed direction, information is recorded by canceling the orientation. Moreover, since a reflecting layer reflects the incident light which carried out incidence through the orientation layer, it can detect the existence of orientation discharge by the reflected light.

[0012] Moreover, if it is in a configuration according to claim 2, the laminating of the protective layer is carried out to the top face of an orientation layer.

[0013] Moreover, if it is in a configuration according to claim 3, an information record medium is formed in plate-like some or plate-like all of a base material.

[0014] Moreover, if it is in a configuration according to claim 4, since a heat-resistant layer intercepts heat conduction and a laminating is carried out to the inferior surface of tongue of a reflecting layer, a base material does not carry out heat deformation of it.

[0015] Moreover, if it was in the configuration according to claim 5, after incident light polarizes in the direction of orientation of an orientation layer, and the different direction, it is reflected by the reflecting layer through an orientation layer. And the field where the orientation of an orientation layer was canceled by this reflected light can be recognized.

[0016] Moreover, if it is in a configuration according to claim 6, the different polarization direction from the direction of orientation of an orientation layer is penetrated, it is reflected by the reflecting layer, and the exposure light which a luminescence means irradiates turns into the reflected light. And if a detection means detects the quantity of light of the reflected light, based on this detection result, a playback means will generate playback information.

[0017]

[Example]

1. Explain the configuration of one example of this invention below the configuration of a 1st example A. example, referring to drawing 1 -3. In this example, the information which should be recorded on an information record medium is printing patterns, such as an alphabetic character and a notation. Drawing 1 is drawing having shown the cross section of the information card used in this example. In drawing, information card A consists of the base materials 1 and the information record media a on monotonous, and the information record medium a has the following components 2 thru/or 5.

[0018] First, 2 is a heat-resistant layer and heat is intercepted by this layer. As an ingredient of the heat-resistant layer 2, it excels in adhesion with a metal comparatively, and the heat-resistant high matter is used. Moreover, 3 is a metallic reflective layer which reflects incident light, and aluminum is used for the ingredient.

[0019] Moreover, 4 is an extension oriented film, orientation is made in the fixed direction and informational record is performed by canceling this orientation partially. The 12-micrometer polyethylene terephthalate (PET) which carried out [polyethylene terephthalate] biaxial extension and was obtained as the material is used.

[0020] Moreover, 5 is a protective layer, and a predetermined ingredient is vapor-deposited by the top face of the extension oriented film 4, and it is formed in it. Inorganic substances, such as SiO₂, an alumina, titanium oxide, or glass, are used for the ingredient. Generating of printing marks based on heat deformation of the extension oriented film 4 is prevented by this protective layer 5.

[0021] Next, the configuration of the information recording device used in this example is explained. Drawing 2 is the block diagram of an information recording apparatus. In drawing, 10 is a record means and generates binary-signal 10a based on recording information aa. Here, recording information aa is the information corresponding to the information corresponding to a printing pattern, or a bar code.

Moreover, 11 is a thermal head and records on information card A based on binary-signal 10a. That is, a thermal head 11 generates heat, when binary-signal 10a expresses "1", and when binary-signal 10a expresses "0", it does not generate heat. And when recording information aa expresses a printing pattern, a predetermined alphabetic character or a predetermined notation is recorded on information card A, and on the other hand, when recording information aa is a bar code, predetermined code information is recorded on information card A.

[0022] Next, the principle which recognizes the contents of record of an information card by viewing is explained. Drawing 3 is drawing showing the principle of incident light and the reflected light. In drawing, B is a polarization film and it is used for an operator recognizing the contents of record of information card A with the naked eye. Orientation of this polarization film B is carried out in the direction of an arrow head S. Moreover, X is incident light, this incident light X is the white lights, such as the natural light, and incidence is carried out to the extension oriented film 4 of information card A through the polarization film B. Moreover, Y is the reflected light and is the light which incident light X reflected by the metallic reflective layer 3 of information card A.

[0023] B. Explain record actuation of an information recording device using drawing 2 of an example of operation. If information card A is inserted in an information recording device, the device system which is not illustrated will convey information card A in the direction of the arrow head in drawing synchronizing with binary-signal 10a. And only the period when, as for a thermal head 11, binary-signal 10a expresses "1" generates heat. Therefore, corresponding to binary-signal 10a, the heating unit part P arises in the extension oriented film 4, and the molecular orientation of the heating unit part P is canceled. That is, the part of which orientation was canceled, and the part of which orientation is not canceled arise. Therefore, information record based on discharge and un-canceling is performed. [of orientation] Since generation of heat produced at this time in case information is recorded is intercepted in the heat-resistant layer 2, a base material 1 does not carry out heat deformation of it.

[0024] Thus, although the part of which orientation was canceled exists in the recorded information record medium, since it cannot recognize discharge and un-canceling directly with the naked eye, recording information aa cannot be viewed. [of orientation]

[0025] Next, the case where the contents of record of an information record medium are recognized by viewing is explained using drawing 3 and 4. If it is when incident light X carries out incidence to the part from which the orientation of the extension oriented film 4 is un-canceling, as shown in drawing 3, in case it penetrates polarizing filter B, incident light X receives the linearly polarized light of the same direction as the direction S of orientation, after that, penetrates the extension oriented film 4 and receives further polarization of the same direction as the direction T of orientation. Consequently, the transmitted light of the extension oriented film 4 turns into light which received elliptically polarized light. And it is reflected by the metallic reflective layer 3, the light which received elliptically polarized light turns into the reflected light Y through the extension oriented film 4 and the polarization film B, and this reflected light Y carries out incidence to people's eyes.

[0026] Here, since the reflected light Y turns into light from which the intensity of light is different with wavelength for the effect ***** reason of the orientation of the extension oriented film 4, it is recognized by people's eyes as a condition (condition which shone) that a hue changes delicately.

[0027] On the other hand, if it is when incident light X carries out incidence to the part of which the orientation of the extension oriented film 4 is canceled as shown in drawing 4, it becomes what received only the linearly polarized light by the polarization film B, and this transmitted light is reflected by the metallic reflective layer 3, again, the transmitted light of the extension oriented film 4 turns into the reflected light Y through the extension oriented film 4 and the polarization film B, and this reflected light Y carries out incidence to people's eyes.

[0028] Here, since the reflected light Y does not have effect receptacle **** of the orientation of the extension oriented film 4, by people's eyes, change of a hue is not recognized but only the color of the polarization film B is recognized. Therefore, the alphabetic character currently recorded on information card A serves as a color of polarizing filter B about the part, and can be distinguished from other parts from which a hue changes delicately. Thus, the information recorded when using the polarization film B can be recognized.

[0029] 2. In the information recorded on information card A with the information regenerative apparatus, the 2nd example of the 2nd example is a mechanical reading **** thing, and is different from the 1st example in that recording information aa is binary information, such as a bar code. In addition, information card A and an information recording device are the same as that of the 1st example.

[0030] Drawing 5 is the block diagram showing the configuration of an information regenerative apparatus. In drawing, 20 is a light-emitting part and the white light is irradiated from here. Moreover, B is a polarization film and orientation is carried out in the direction of an arrow head S. 21 is a light sensing portion and signal 21a which consists of optical/electrical converters (not shown) and expresses the quantity of light of the reflected light here is generated. Moreover, 22 is a comparison means, signal 21a is compared with a reference value R here, and the playback information bb is generated.

[0031] Next, actuation of an information regenerative apparatus is explained using drawing 5 and 6. If it is when reproducing the part on which binary-signal 10a showing "0" was recorded (playback of an orientation a non-canceling part), as shown in drawing 5, in case it penetrates polarizing filter B, exposure light 20a receives the linearly polarized light of the same direction as the direction S of orientation, after that, penetrates the extension oriented film 4 and receives further polarization of the same direction as the direction T of orientation. Consequently, the transmitted light of the extension oriented film 4 turns into light which received elliptically polarized light. And it is reflected by the metallic reflective layer 3, and incidence of the light which received elliptically polarized light is carried out to a light sensing portion 21 through the extension oriented film 4 and the polarization film B.

[0032] Since optical 20b which carries out incidence to this light sensing portion 21 becomes the light influenced of the orientation by the extension oriented film 4, signal 21a showing that quantity of light is set to a low as compared with the quantity of light of the transmitted light of the extension oriented film 4 of which orientation was canceled. Moreover, a reference value R is set as the level which can distinguish discharge and un-canceling. [of orientation] Therefore, signal 21a is less than a reference value R, and the playback information bb serves as a low level.

[0033] If it is when reproducing the part on which binary-signal 10a which expresses "1" that it

illustrates to drawing 6 on the other hand was recorded (playback of an orientation discharge part), since the orientation of the predetermined part of the extension oriented film 4 is canceled, in case exposure light 20a penetrates the extension oriented film 4, it does not polarize. For this reason, the transmitted light of the extension oriented film 4 becomes what received only the linearly polarized light by the polarization film B. And it is reflected by the metallic reflective layer 3, and incidence of this transmitted light is again carried out to a light sensing portion 21 through the extension oriented film 4 and the polarization film B.

[0034] Since optical 20b which carries out incidence to this light sensing portion 21 becomes the light which has not been influenced of the orientation by the extension oriented film 4, signal 21a showing that quantity of light is set to a high level as compared with the transmitted light of the extension oriented film 4 of which orientation is not canceled. Moreover, as described above, the reference value R is set as the level which can distinguish discharge and un-canceling. [of orientation] Therefore, signal 21a exceeds a reference value R, consequently is set to the playback information bb being high-level.

[0035] Thus, high level and a low level are distinguished based on the quantity of light of the reflected light Y, and the information recorded by whether the orientation of the extension oriented film 4 is canceled can be reproduced as playback information bb.

[0036] 3. The various deformation which it is not limited to the example mentioned above and is described below is possible for modification this invention.

** As for the ingredient of the heat-resistant layer 2, in each above-mentioned example, it is more desirable than the extension oriented film 4 to use the ingredient excellent in thermal resistance. Moreover, what is hung up over below can be used as the ingredient. That is, the resin which does not have the melting point like cellulose system resin, the hardening mold resin hardened by heat or light, or an inorganic substance is usable. Specifically, a nitrocellulose, PVA and CMC, an epoxy resin, a vinyl chloride vinyl acetate copolymer, acrylic polyol, polyester resin, phenol resin, imide resin, urethane resin, a urea resin, melamine resin, amide resin, aramid resin, or UV hardening resin can be used. Furthermore, you may use, combining these ingredients two or more.

[0037] ** In each above-mentioned example, tin, silver, magnesium, chromium, or nickel can be used for the ingredient of a metallic reflective layer 3 instead of aluminum that what is necessary is just the ingredient which can produce a film by the vacuum deposition method, a spatter, etc.

[0038] ** In each above-mentioned example, if the extension oriented film 4 is thermosetting resin in which extension orientation is transparent and possible, it is arbitrary. As the material, polyethylene, a polyethylene TEX rate, polypropylene, a vinyl chloride, a vinyl chloride vinyl acetate copolymer, acrylic resin, a polycarbonate, polyester, a vinylidene chloride, or a liquid crystal macromolecule can be used, for example. Moreover, as a liquid crystal macromolecule, lyotropic ** or thermotropic ** is suitable. In lyotropic **, the Pori PARAFENIRENTEREFUTARU amide, Pori PARAFENIREMBENZO bis-oxazole, or a Pori PARAFENIREMBENZO bis-thiazole can be used. Moreover, in thermotropic **, the liquid crystal light molecule of the polyester system represented by an EKONORU mold, a BEKUTORAN mold, X7G mold, etc. can be used.

[0039] ** In each above-mentioned example, UV hardening resin, acrylic resin, polyester resin, urethane resin, or melamine resin can be used for a protective layer 5. In this case, unguents, such as silicon, metallic soap, or a wax, may be added, or fillers, such as a silica, talc, the activated clay, a kaolin, a calcium carbonate, a magnesium carbonate, Teflon, a silicon particle, or starch, may be added.

[0040] ** In the above-mentioned example, as an ingredient of the polarization film B, macromolecule crystal molds, such as a polyene mold, a PVA-iodine mold, a two-color color mold, a metal content mold, or a metallic-compounds content mold can be used, and a PVA-iodine mold and a two-color color mold are suitable especially.

[0041]

[Effect of the Invention] According to the configuration it was indicated to claims 1-4 that mentioned above, the record playback of the information can be carried out by the existence of orientation discharge of an orientation layer. Moreover, since the contents of recording information are made to

invisibility, the high information record medium of security can be offered. Since the heat-resistant layer was especially prepared in the inferior surface of tongue of a reflecting layer according to the configuration according to claim 4, heat deformation of a base material can be prevented.

[0042] Moreover, the contents of recording information can be recognized visually, and since the part that the orientation of an orientation layer is not canceled is recognized as a condition (condition which shone) that a hue changes delicately, it is desirable according to the configuration according to claim 5, also in the field of finery.

[0043] Moreover, according to the configuration according to claim 6, since the quantity of light of the reflected light detects the existence of orientation discharge of an orientation layer, recording information is reproducible.

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TECHNICAL FIELD

[Industrial Application] This invention relates to an information record medium, an information record card, the information playback approach, an information regenerative apparatus, and the information record playback approach.

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PRIOR ART

[Description of the Prior Art] Although the information which identifies goods, such as a bar code, was the visible information which can carry out direct recognition, there is from a viewpoint which prevents forgery to make such information into invisibility. A bar code and a pattern are imprinted to a transparent material, or the technique which carries out [the technique] transparence printing and is made into invisibility from such a request is developed. and the colorless ingredient which has an absorption property on specific wavelength as an ingredient used for such an application -- or specific wavelength was absorbed and the almost colorlessness ingredient which emits the light of different wavelength from the absorption wavelength was developed.

[0003] By the way, generally, when recording information, such as a bar code, on an information record medium, the case where different information for every information record medium is recorded, and the information same, to two or more information record media may be recorded. The former is a case in order to manage goods according to an individual at the store where goods were delivered, so that different information for every information record medium may be recorded, and the latter is a case so that information, such as a price, may be recorded on two or more information record media, before shipping goods. When printing the information which differs for every information record medium using a thermal head in applying the ingredient mentioned above to the former and applying to the latter, pattern printing of the above-mentioned ingredient was carried out to the field according to the information which should be recorded, and the information record medium which recorded the same information was created in large quantities.

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EFFECT OF THE INVENTION

[Effect of the Invention] According to the configuration it was indicated to claims 1-4 that mentioned above, the record playback of the information can be carried out by the existence of orientation discharge of an orientation layer. Moreover, since the contents of recording information are made to invisibility, the high information record medium of security can be offered. Since the heat-resistant layer was especially prepared in the inferior surface of tongue of a reflecting layer according to the configuration according to claim 4, heat deformation of a base material can be prevented.

[0042] Moreover, the contents of recording information can be recognized visually, and since the part that the orientation of an orientation layer is not canceled is recognized as a condition (condition which shone) that a hue changes delicately, it is desirable according to the configuration according to claim 5, also in the field of finery.

[0043] Moreover, according to the configuration according to claim 6, since the quantity of light of the reflected light detects the existence of orientation discharge of an orientation layer, recording information is reproducible.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] By the way, the above-mentioned ingredient has the perfect color that it is not transparent and colorless and general a little thin. Especially a leuco color or a chelate type coloring mold color has many black things which it is, and are carried out and are colored green. Therefore, when the laminating of the concealment layer was not carried out on the layer which recorded information, the recorded information could not be completely concealed to the conventional information record medium, but it had the fault that forgery of an information record medium was easy. While offering the information record medium and information card which this invention is made in view of the starting situation, and prevented from viewing the recorded information completely, it aims at reproducing the information recorded from these.

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MEANS

[Means for Solving the Problem] If it is in a configuration according to claim 1 in order to solve the above-mentioned technical problem, in the information record medium which can reproduce information optically, it is characterized by carrying out the laminating of the orientation layer by which orientation was carried out in the fixed direction on the top face of a reflecting layer which reflects incident light.

[0006] Moreover, if it is in a configuration according to claim 2, it is characterized by carrying out the laminating of the protective layer to the top face of said orientation layer.

[0007] Moreover, if it is in a configuration according to claim 3, it is characterized by forming an information record medium according to claim 1 or 2 in plate-like some or plate-like all of a base material.

[0008] Moreover, if it is in a configuration according to claim 4, it is characterized by carrying out the laminating of the heat-resistant layer which intercepts heat conduction on the inferior surface of tongue of said reflecting layer.

[0009] moreover, if it is in a configuration according to claim 5, the orientation layer of which the orientation of the field corresponding to recording information was canceled, and a reflecting layer from the information record medium which comes to carry out a laminating Are the information playback approach which reproduces the above-mentioned recording information, and incident light is polarized in the direction of orientation of the above-mentioned orientation layer, and the different direction. It is characterized by reflecting this incident light that polarized by the reflecting layer through the above-mentioned orientation layer, recognizing the field where the orientation of the above-mentioned orientation layer was canceled by that reflected light, and reproducing the above-mentioned recording information.

[0010] Moreover, a luminescence means to be the information regenerative apparatus which reproduces information and to irradiate exposure light from the information record medium which comes to carry out the laminating of the orientation layer of which the orientation of the field corresponding to recording information was canceled, and the reflecting layer if it is in a configuration according to claim 6, The polarization film which has the polarization direction which is inserted between this luminescence means and the above-mentioned information record medium, and is different from the direction of orientation of the above-mentioned orientation layer, The above-mentioned exposure light which penetrated this polarization film and the above-mentioned orientation layer has a detection means to detect the quantity of light of the reflected light reflected by the above-mentioned reflecting layer, and a playback means to generate playback information based on the detection result of this detection means.

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OPERATION

[Function] If it is in a configuration according to claim 1, since orientation of the orientation layer is carried out in the fixed direction, information is recorded by canceling the orientation. Moreover, since a reflecting layer reflects the incident light which carried out incidence through the orientation layer, it can detect the existence of orientation discharge by the reflected light.

[0012] Moreover, if it is in a configuration according to claim 2, the laminating of the protective layer is carried out to the top face of an orientation layer.

[0013] Moreover, if it is in a configuration according to claim 3, an information record medium is formed in plate-like some or plate-like all of a base material.

[0014] Moreover, if it is in a configuration according to claim 4, since a heat-resistant layer intercepts heat conduction and a laminating is carried out to the inferior surface of tongue of a reflecting layer, a base material does not carry out heat deformation of it.

[0015] Moreover, if it was in the configuration according to claim 5, after incident light polarizes in the direction of orientation of an orientation layer, and the different direction, it is reflected by the reflecting layer through an orientation layer. And the field where the orientation of an orientation layer was canceled by this reflected light can be recognized.

[0016] Moreover, if it is in a configuration according to claim 6, the different polarization direction from the direction of orientation of an orientation layer is penetrated, it is reflected by the reflecting layer, and the exposure light which a luminescence means irradiates turns into the reflected light. And if a detection means detects the quantity of light of the reflected light, based on this detection result, a playback means will generate playback information.

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EXAMPLE

[Example]

1. Explain the configuration of one example of this invention below the configuration of a 1st example A. example, referring to drawing 1 -3. In this example, the information which should be recorded on an information record medium is printing patterns, such as an alphabetic character and a notation. Drawing 1 is drawing having shown the cross section of the information card used in this example. In drawing, information card A consists of the base materials 1 and the information record media a on monotonous, and the information record medium a has the following components 2 thru/or 5.

[0018] First, 2 is a heat-resistant layer and heat is intercepted by this layer. As an ingredient of the heat-resistant layer 2, it excels in adhesion with a metal comparatively, and the heat-resistant high matter is used. Moreover, 3 is a metallic reflective layer which reflects incident light, and aluminum is used for the ingredient.

[0019] Moreover, 4 is an extension oriented film, orientation is made in the fixed direction and informational record is performed by canceling this orientation partially. The 12-micrometer polyethylene terephthalate (PET) which carried out [polyethylene terephthalate] biaxial extension and was obtained as the material is used.

[0020] Moreover, 5 is a protective layer, and a predetermined ingredient is vapor-deposited by the top face of the extension oriented film 4, and it is formed in it. Inorganic substances, such as SiO₂, an alumina, titanium oxide, or glass, are used for the ingredient. Generating of printing marks based on heat deformation of the extension oriented film 4 is prevented by this protective layer 5.

[0021] Next, the configuration of the information recording device used in this example is explained.

Drawing 2 is the block diagram of an information recording apparatus. In drawing, 10 is a record means and generates binary-signal 10a based on recording information aa. Here, recording information aa is the information corresponding to the information corresponding to a printing pattern, or a bar code.

Moreover, 11 is a thermal head and records on information card A based on binary-signal 10a. That is, a thermal head 11 generates heat, when binary-signal 10a expresses "1", and when binary-signal 10a expresses "0", it does not generate heat. And when recording information aa expresses a printing pattern, a predetermined alphabetic character or a predetermined notation is recorded on information card A, and on the other hand, when recording information aa is a bar code, predetermined code information is recorded on information card A.

[0022] Next, the principle which recognizes the contents of record of an information card by viewing is explained. Drawing 3 is drawing showing the principle of incident light and the reflected light. In drawing, B is a polarization film and it is used for an operator recognizing the contents of record of information card A with the naked eye. Orientation of this polarization film B is carried out in the direction of an arrow head S. Moreover, X is incident light, this incident light X is the white lights, such as the natural light, and incidence is carried out to the extension oriented film 4 of information card A through the polarization film B. Moreover, Y is the reflected light and is the light which incident light X reflected by the metallic reflective layer 3 of information card A.

[0023] B. Explain record actuation of an information recording device using drawing 2 of an example of

operation. If information card A is inserted in an information recording device, the device system which is not illustrated will convey information card A in the direction of the arrow head in drawing synchronizing with binary-signal 10a. And only the period when, as for a thermal head 11, binary-signal 10a expresses "1" generates heat. Therefore, corresponding to binary-signal 10a, the heating unit part P arises in the extension oriented film 4, and the molecular orientation of the heating unit part P is canceled. That is, the part of which orientation was canceled, and the part of which orientation is not canceled arise. Therefore, information record based on discharge and un-canceling is performed. [of orientation] Since generation of heat produced at this time in case information is recorded is intercepted in the heat-resistant layer 2, a base material 1 does not carry out heat deformation of it.

[0024] Thus, although the part of which orientation was canceled exists in the recorded information record medium, since it cannot recognize discharge and un-canceling directly with the naked eye, recording information aa cannot be viewed. [of orientation]

[0025] Next, the case where the contents of record of an information record medium are recognized by viewing is explained using drawing 3 and 4. If it is when incident light X carries out incidence to the part from which the orientation of the extension oriented film 4 is un-canceling, as shown in drawing 3, in case it penetrates polarizing filter B, incident light X receives the linearly polarized light of the same direction as the direction S of orientation, after that, penetrates the extension oriented film 4 and receives further polarization of the same direction as the direction T of orientation. Consequently, the transmitted light of the extension oriented film 4 turns into light which received elliptically polarized light. And it is reflected by the metallic reflective layer 3, the light which received elliptically polarized light turns into the reflected light Y through the extension oriented film 4 and the polarization film B, and this reflected light Y carries out incidence to people's eyes.

[0026] Here, since the reflected light Y turns into light from which the intensity of light is different with wavelength for the effect ***** reason of the orientation of the extension oriented film 4, it is recognized by people's eyes as a condition (condition which shone) that a hue changes delicately.

[0027] On the other hand, if it is when incident light X carries out incidence to the part of which the orientation of the extension oriented film 4 is canceled as shown in drawing 4, it becomes what received only the linearly polarized light by the polarization film B, and this transmitted light is reflected by the metallic reflective layer 3, again, the transmitted light of the extension oriented film 4 turns into the reflected light Y through the extension oriented film 4 and the polarization film B, and this reflected light Y carries out incidence to people's eyes.

[0028] Here, since the reflected light Y does not have effect receptacle **** of the orientation of the extension oriented film 4, by people's eyes, change of a hue is not recognized but only the color of the polarization film B is recognized. Therefore, the alphabetic character currently recorded on information card A serves as a color of polarizing filter B about the part, and can be distinguished from other parts from which a hue changes delicately. Thus, the information recorded when using the polarization film B can be recognized.

[0029] 2. In the information recorded on information card A with the information regenerative apparatus, the 2nd example of the 2nd example is a mechanical reading **** thing, and is different from the 1st example in that recording information aa is binary information, such as a bar code. In addition, information card A and an information recording device are the same as that of the 1st example.

[0030] Drawing 5 is the block diagram showing the configuration of an information regenerative apparatus. In drawing, 20 is a light-emitting part and the white light is irradiated from here. Moreover, B is a polarization film and orientation is carried out in the direction of an arrow head S. 21 is a light sensing portion and signal 21a which consists of optical/electrical converters (not shown) and expresses the quantity of light of the reflected light here is generated. Moreover, 22 is a comparison means, signal 21a is compared with a reference value R here, and the playback information bb is generated.

[0031] Next, actuation of an information regenerative apparatus is explained using drawing 5 and 6. If it is when reproducing the part on which binary-signal 10a showing "0" was recorded (playback of an orientation a non-canceling part), as shown in drawing 5, in case it penetrates polarizing filter B, exposure light 20a receives the linearly polarized light of the same direction as the direction S of

orientation, after that, penetrates the extension oriented film 4 and receives further polarization of the same direction as the direction T of orientation. Consequently, the transmitted light of the extension oriented film 4 turns into light which received elliptically polarized light. And it is reflected by the metallic reflective layer 3, and incidence of the light which received elliptically polarized light is carried out to a light sensing portion 21 through the extension oriented film 4 and the polarization film B.

[0032] Since optical 20b which carries out incidence to this light sensing portion 21 becomes the light influenced of the orientation by the extension oriented film 4, signal 21a showing that quantity of light is set to a low as compared with the quantity of light of the transmitted light of the extension oriented film 4 of which orientation was canceled. Moreover, a reference value R is set as the level which can distinguish discharge and un-canceling. [of orientation] Therefore, signal 21a is less than a reference value R, and the playback information bb serves as a low level.

[0033] If it is when reproducing the part on which binary-signal 10a which expresses "1" that it illustrates to drawing 6 on the other hand was recorded (playback of an orientation discharge part), since the orientation of the predetermined part of the extension oriented film 4 is canceled, in case exposure light 20a penetrates the extension oriented film 4, it does not polarize. For this reason, the transmitted light of the extension oriented film 4 becomes what received only the linearly polarized light by the polarization film B. And it is reflected by the metallic reflective layer 3, and incidence of this transmitted light is again carried out to a light sensing portion 21 through the extension oriented film 4 and the polarization film B.

[0034] Since optical 20b which carries out incidence to this light sensing portion 21 becomes the light which has not been influenced of the orientation by the extension oriented film 4, signal 21a showing that quantity of light is set to a high level as compared with the transmitted light of the extension oriented film 4 of which orientation is not canceled. Moreover, as described above, the reference value R is set as the level which can distinguish discharge and un-canceling. [of orientation] Therefore, signal 21a exceeds a reference value R, consequently is set to the playback information bb being high-level.

[0035] Thus, high level and a low level are distinguished based on the quantity of light of the reflected light Y, and the information recorded by whether the orientation of the extension oriented film 4 is canceled can be reproduced as playback information bb.

[0036] 3. The various deformation which it is not limited to the example mentioned above and is described below is possible for modification this invention.

** As for the ingredient of the heat-resistant layer 2, in each above-mentioned example, it is more desirable than the extension oriented film 4 to use the ingredient excellent in thermal resistance. Moreover, what is hung up over below can be used as the ingredient. That is, the resin which does not have the melting point like cellulose system resin, the hardening mold resin hardened by heat or light, or an inorganic substance is usable. Specifically, a nitrocellulose, PVA and CMC, an epoxy resin, a vinyl chloride vinyl acetate copolymer, acrylic polyol, polyester resin, phenol resin, imide resin, urethane resin, a urea resin, melamine resin, amide resin, aramid resin, or UV hardening resin can be used. Furthermore, you may use, combining these ingredients two or more.

[0037] ** In each above-mentioned example, tin, silver, magnesium, chromium, or nickel can be used for the ingredient of a metallic reflective layer 3 instead of aluminum that what is necessary is just the ingredient which can produce a film by the vacuum deposition method, a spatter, etc.

[0038] ** In each above-mentioned example, if the extension oriented film 4 is thermosetting resin in which extension orientation is transparent and possible, it is arbitrary. As the material, polyethylene, a polyethylene TEX rate, polypropylene, a vinyl chloride, a vinyl chloride vinyl acetate copolymer, acrylic resin, a polycarbonate, polyester, a vinylidene chloride, or a liquid crystal macromolecule can be used, for example. Moreover, as a liquid crystal macromolecule, lyotropic ** or thermotropic ** is suitable. In lyotropic **, the Pori PARAFENIRENTEREFUTARU amide, Pori PARAFENIREMBENZO bis-oxazole, or a Pori PARAFENIREMBENZO bis-thiazole can be used. Moreover, in thermotropic **, the liquid crystal light molecule of the polyester system represented by an EKONORU mold, a BEKUTORAN mold, X7G mold, etc. can be used.

[0039] ** In each above-mentioned example, UV hardening resin, acrylic resin, polyester resin, urethane resin, or melamine resin can be used for a protective layer 5. In this case, unguents, such as silicon, metallic soap, or a wax, may be added, or fillers, such as a silica, talc, the activated clay, a kaolin, a calcium carbonate, a magnesium carbonate, Teflon, a silicon particle, or starch, may be added.

[0040] ** In the above-mentioned example, as an ingredient of the polarization film B, macromolecule crystal molds, such as a polyene mold, a PVA-iodine mold, a two-color color mold, a metal content mold, or a metallic-compounds content mold can be used, and a PVA-iodine mold and a two-color color mold are suitable especially.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the sectional view of the information card used for one example of this invention.

[Drawing 2] It is the block diagram of the information recording apparatus used for one example of this invention.

[Drawing 3] It is drawing showing the principle of the incident light about the part of which orientation is canceled, and the reflected light.

[Drawing 4] It is drawing showing the principle of the incident light about a part, and the reflected light of which orientation is not canceled.

[Drawing 5] It is drawing showing actuation of the information regenerative apparatus about the part of which orientation is canceled.

[Drawing 6] It is drawing showing actuation of the information regenerative apparatus about the part of which orientation is not canceled.

[Description of Notations]

- 1 Base Material
- 2 Heat-resistant Layer
- 3 Metallic Reflective Layer (Reflecting Layer)
- 4 Extension Oriented Film (Orientation Layer)
- 5 Protective Layer
- 20 Light-emitting Part (Luminescence Means)
- 21 Light Sensing Portion (Detection Means)
- 22 Playback Means (Comparison Means)
- A Information card.
- B Polarization film
- aa Recording information
- bb Playback information
- X Exposure light

[Translation done.]

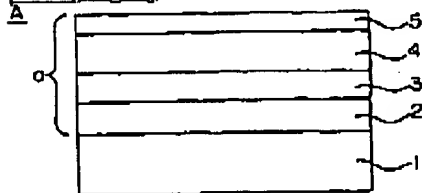
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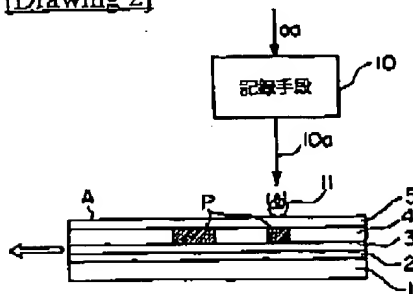
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DRAWINGS

[Drawing 1]

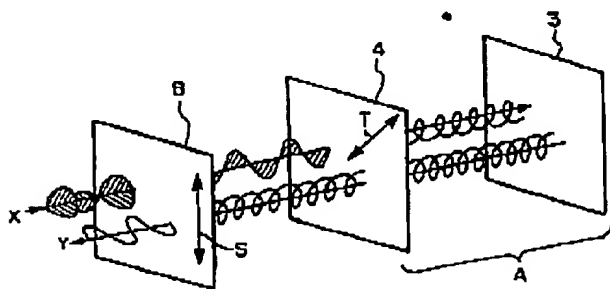


[Drawing 2]



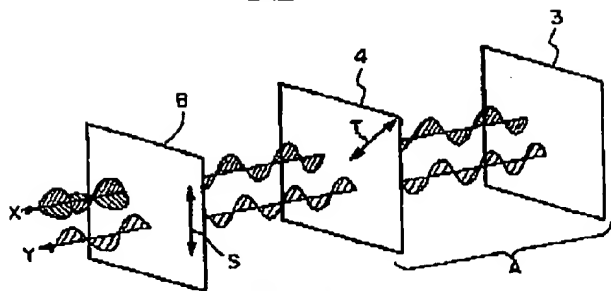
[Drawing 3]

配向解除部分の概図



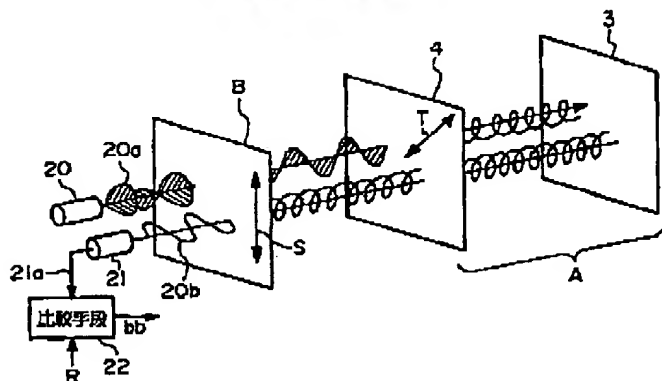
[Drawing 4]

配向非解除部分の原理



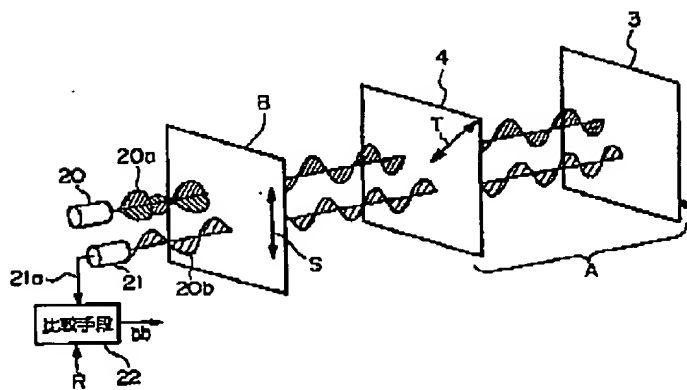
[Drawing 5]

配向解除部分の再生



[Drawing 6]

配向非解除部分の再生



[Translation done.]